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| FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER MAPA, MICHAEL Y | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,432

Applicant(s)

LUDOVICO ET AL.

Examiner

Michael Mapa

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/15/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 08/15/06 has been considered by the examiner.

Claim Objections

2. Claims 25-26, 29, 31-35 are objected to because of the following informalities: The applicant has failed to provide a more detailed information on the following terms: "neighborhood", "previous items" & "enriched". The examiner requests the applicant to further clarify the terms with information in the specification or to change the terms in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 44, 45 & 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 44, 45 & 47 recites the limitations "processing system", "computer program product" & "a telecommunications network" and is dependent upon a method claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 24-39, and 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. (US Patent Publication 2004/0127224 herein after referenced as Furukawa) in view of Gustafsson (US Patent Publication 2003/0087641 herein after referenced as Gustafsson).

Regarding claim 24, Furukawa discloses "A method for selecting a subset of sites within a whole set of candidate sites for activating one or more radio stations in a telecommunications network comprising the steps of building an initial solution comprising a subset of sites obtained by starting from a potential network configuration comprising as active the whole set of candidate sites." (Paragraph [0062] - [0063], wherein Furukawa discloses excluding location candidate points where the base station is impossible to install and wherein no traffic occurs.) Furukawa discloses "optimising the initial solution by activating "inactive" sites, in order to minimise a predetermined cost function for the solution" (Fig. 2 & Paragraph [0064]-[0079], wherein Furukawa discloses activating each candidate location for a base station until the traffic coverage ratio is greater than the required traffic coverage ratio.)

Furukawa fails to explicitly recite "said steps of building and optimising the initial solution being adapted to define solutions having a geographic coverage wider than a

predefined minimum coverage area and being adapted to manage an amount of traffic greater than a predefined minimum value of expected traffic"

In a related field of endeavor, Gustafsson discloses "said steps of building and optimising the initial solution being adapted to define solutions having a geographic coverage wider than a predefined minimum coverage area and being adapted to manage an amount of traffic greater than a predefined minimum value of expected traffic" (Paragraph [0054] & [0016], wherein Gustafsson discloses a minimum coverage as well as disclosing cell breathing wherein the more traffic is carried by a cell, the smaller the coverage area of the cell becomes)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Furukawa to include the design methods taught by Gustafsson, the motivation for combining being to improve the existing simulation methods for planning and speed up the planning and evaluation process. (Paragraph [0006] of Gustafsson)

Regarding claim 25, Furukawa in view of Gustafsson discloses "The method according to claim 24." In addition, the combination discloses "generating a neighborhood of solutions of the current solution by activating "inactive" sites (Fig. 2 & Fig. 3 & Paragraph [0070] of Furukawa). The combination discloses "computing a predetermined cost function of solutions belonging to the neighborhood and selecting a best solution of the neighborhood as current solution, depending on the respective cost values" (Paragraph [0072] of Furukawa). The combination discloses "determining a set of solutions in a current solution neighborhood; (Fig. 3 & Paragraph [0070] of

Furukawa). The combination discloses "iteratively applying steps i) - iii) until a predefined processing time is elapsed. (Fig. 2 & Paragraph [0079], wherein Furukawa discloses the processing returns to step Z0-1 if the condition of $R_c > R_{th}$ is not satisfied, therefore a predetermined processing time.)"

Regarding claim 26, Furukawa in view of Gustafsson discloses "The method according to claim 25 comprising the steps of: verifying, upon each iteration, that in the set of solutions in the current solution neighborhood at least one solution has a geographic coverage area greater than the predefined minimum coverage area and is adapted to manage an amount of traffic greater than the predefined minimum value of expected traffic." (Paragraph [0054] & [0016], wherein Gustafsson discloses a minimum coverage as well as disclosing cell breathing wherein the more traffic is carried by a cell, the smaller the coverage area of the cell becomes. And Fig. 2 & Paragraph [0076], wherein Furukawa discloses the traffic quantity inside a cell is set to be less than the maximum traffic quantity that can be processed in one base station.) The combination discloses "in case such check is not satisfied for a predefined number of iterations, building a solution satisfying these conditions through a random activation of one or more cells/sites starting from the current solution and consequently returning to step i) of generating the neighborhood of solutions applied to a thereby built solution." (Fig. 2 & Paragraph [0079] of Furukawa)

Regarding claim 27, Furukawa in view of Gustafsson discloses "The method according to claim 25, wherein the predefined minimum coverage area and the predefined minimum expected traffic are defined depending on the coverage area and

traffic guaranteed by the potential network configuration.” (Paragraph [0103] of Furukawa).

Regarding claim 28, Furukawa in view of Gustafsson discloses “The method according to claim 27, wherein solutions with relaxed constraints are allowed for which the coverage area and the amount of managed traffic related to the selected subset of sites are included within a relaxation threshold of the predefined requirements of minimum coverage area and minimum expected traffic.” (Fig. 2 & Paragraph [0079] of Furukawa)

Regarding claim 29, Furukawa in view of Gustafsson discloses “The method according to claim 28, wherein the step of determining the set of neighborhood solutions comprises at least one of the following steps: storing the best solution in terms of cost that shows a geographic coverage area that is greater than said minimum coverage area and is adapted to manage an amount of traffic that is greater than said minimum expected traffic value” (Fig. 2 & Paragraph [0070]-[0072], wherein Furukawa discloses computing and recording the value of the objective function and selecting the maximum value among all the recorded ones to decide to locate the base station.)

Regarding claim 30, Furukawa in view of Gustafsson discloses “The method according to claim 24, wherein the initial solution comprises the cells belonging to a predefined list of compulsorily active cells and the cells deemed as “not able to be turned off” due to a higher cell load than a predefined threshold load in the potential network configuration” (Paragraph [0120] of Furukawa).

Regarding claim 31, Furukawa in view of Gustafsson discloses "The method according to claim 30, wherein, in case said initial solution does not have a coverage area that is greater than said minimum area and an amount of traffic that is greater than said minimum traffic value" (Fig. 2 & Fig. 11 & Paragraph [0121], wherein Furukawa discloses the traffic coverage is recomputed and is identical to the processing of step Z0-8 of Fig. 2). Furukawa discloses "the cells deemed in the "able to be turned off" status due to a lower cell load than a predefined threshold load in the potential network configuration, but not having in such configuration any adjacent cell in soft hand-over." (Paragraph [0120]).

Regarding claim 32, Furukawa in view of Gustafsson discloses "The method according to claim 31, wherein, in case said enriched initial solution does not have a coverage area that is greater than said minimum area and an amount of traffic that is greater than said minimum traffic value, and the average load of cells in the potential network configuration is greater than a predefined threshold load, said solution is further enriched by cells having a low load and candidate to "capture" the associated load to cells deemed in the "able to be turned off" status and having one or more adjacent cells in soft hand-over, in the potential network configuration.(Paragraph [0067] of Gustafsson).

Regarding claim 33, Furukawa in view of Gustafsson discloses "The method according to claim 31, wherein, in case said enriched initial solution does not have a coverage area that is greater than said minimum area and an amount of traffic that is greater than said minimum traffic value, and the average load of cells in the potential

network configuration is less than a predefined threshold load, said solution is further enriched by the most adjacent cells in soft hand-over candidate to "capture" the load associated with cells deemed in the "able to be turned off" status and having one or more adjacent cells in soft hand-over, in the potential network configuration."

(Paragraph [0067] of Gustafsson)

Regarding claim 34, Furukawa in view of Gustafsson discloses "The method according to claim 32, wherein, in case said further enriched initial solution does not have a coverage area that is greater than said minimum area and an amount of traffic that is greater than said minimum traffic value, the initial solution is built as solution that minimises the number of active cells among the obtained solutions, starting from the potential network configuration, by deactivating the cells having the lowest coverage area, if, following such deactivation, the remaining coverage area is greater than the predefined minimum area, among a list of cells with which the minimum carried traffic is associated, if, following such deactivation, the remaining carried traffic is greater than the predefined minimum traffic value" (Paragraph [0122] of Furukawa).

Regarding claim 35, Furukawa in view of Gustafsson discloses "The method according to claim 33, wherein, in case said further enriched initial solution does not have a coverage area that is greater than said minimum area and an amount of traffic that is greater than said minimum traffic value, the initial solution is built as solution that minimises the number of active cells among the obtained solutions, starting from the potential network configuration, by deactivating the cells: having the lowest coverage area, if, following such deactivation, the remaining coverage area is greater than the

predefined minimum area, among a list of cells with which the minimum carried traffic is associated, if, following such deactivation, the remaining carried traffic is greater than the predefined minimum traffic value" (Paragraph [0122] of Furukawa).

Regarding claim 36, Furukawa in view of Gustafsson discloses "The method according to claim 25." The examiner rejects claim 36 with the same arguments provided above. (see claim 26).

Regarding claim 37, Furukawa in view of Gustafsson discloses "The method according to claim 36, wherein an activation move comprises the activation of a useful cell having a high adjacency parameter value in soft hand-over toward cells having high cell load values. (Paragraph [0067] of Gustafsson).

Regarding claim 38, Furukawa in view of Gustafsson discloses "The method according to claim 36," Furukawa in view of Gustafsson discloses activating an adjacent cell to relieve the load from a heavily loaded active cell (Paragraph [0067] of Gustafsson), however Gustafsson in view of Furukawa fails to explicitly recite "wherein a deactivation move comprises the deactivation of a cell having a lower cell load and having a high adjacency parameter value in soft hand-over toward at least one active cell having a cell load value that is lower than a pre-established maximum value." The examiner maintains that it is commonly known in the art with regards to cell breathing that after a heavily loaded active cell is relieved of the traffic and the traffic falls below the minimum. The network and the cell will return to normal parameters.

Regarding claim 39, Furukawa in view of Gustafsson discloses "The method according to claim 36, wherein a deactivation move comprises deactivation of a cell

having in soft hand-over adjacency at least one cell able to support the load (Paragraph [0067] of Gustafsson, wherein the heavily loaded active cell B is deactivated from the traffic by having less coverage and wherein cell A is activated to help relieve the load and wherein Gustafsson discloses noise rise tables being updated.) Gustafsson fails to explicitly recite "and for which the ratio between carried traffic by current active cells and placed in pilot pollution by the cell under deactivation, and globally carried traffic by the cell under deactivation, is maximum." However it would have been obvious to one of ordinary skill in the art to have ratio at a maximum sinr (signal to interference and noise ratio) for the purpose of providing better service with a cleaner and clearer signal.

Regarding claim 42, Furukawa in view of Gustafsson discloses "The method according to claim 24, wherein the cost function of a solution is expressed as representing: the ratio between geographic area not served by a subset of active sites and a served area in a potential network configuration;" (Paragraph [0068] of Furukawa.) Furukawa in view of Gustafsson discloses "the ratio between traffic not carried by the subset of active sites and traffic carried in the potential network configuration;" (Paragraph [0068] of Furukawa.) Furukawa in view of Gustafsson discloses "the deviation of load cells of activated cells, from an ideal cell load;" (Paragraph [0117] of Furukawa)

Furukawa in view of Gustafsson discloses Soft HO Gain calculations as part of the modeling (Paragraph [0079]). However, the combination fails to explicitly recite "deviation of soft hand-over loads of activated cells, from an ideal soft hand-over load." The combination discloses calculation of the deviation of activated cell from an ideal cell

(Paragraph [0117] of Furukawa). It would have been obvious to one of ordinary skill in the art to modify the invention to also incorporate the calculation as it relates to the Soft HO for the purpose of achieving a more accurate data of what the system requires to be optimized.

Furukawa in view of Gustafsson fails to disclose "calculating the weighted sum of the plurality of cost functions and the mean square deviation of each cost function". However the examiner maintains that it is obvious for one of ordinary skill in the art to modify the invention to include calculating with the weighted sum and the mean square for the purpose of achieving a more accurate data of what the system requires to be optimized.

Regarding claim 43, Furukawa in view of Gustafsson discloses "The method according to claim 42." The combination fails to disclose "wherein the cost function of a solution comprises a further cost item pointing out the ratio between global traffic in pilot pollution associated with the set of active cells in the examined solution and maximum pilot pollution that can be found in the potential network configuration." Gustafsson discloses the maximum allowed noise to be chosen carefully because if the interference from a cell is so high other cells might have no coverage at all. Therefore, it would have been obvious to one of ordinary skill in the art to calculate the pilot pollution associated with the set of active cells in the examined solution as it relates to the maximum pilot pollution that can be found in the potential configuration the motivation being to calculate the maximum allowed noise so as to prevent cell from having no coverage because of interference.

Regarding claims 44 – 46, Furukawa in view of Gustafsson discloses the apparatus, program and cell design method (Paragraph [0021] of Furukawa). The examiner rejects claims 44-46 with the same arguments provided above. (see claim 24.)

Regarding claim 47, Furukawa in view of Gustafsson discloses “the design for a plurality of radio stations sites selected from a set of candidate sites through a selection method according to claim 24.” Furukawa in view of Gustafsson discloses, fails to explicitly recite a “telecommunications network”, however it would have been well within the scope of one of ordinary skill in the art to recognize that what is applied in the design is also going to be applied to construction of the telecommunications network.

6. Claims 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa in view of Gustafsson, and further in view of Walton et al. (US Patent Publication 2003/0123425 herein after referenced as Walton).

Regarding claims 40 and 41, Furukawa in view of Gustafsson discloses “The method according to claim 29,” The combination fails to disclose “wherein a “restore” procedure is performed for a solution in case it is impossible to build a non-empty neighborhood of the current solution, in which the best stored solution during said iterations is “restored”” or “wherein a “restore” procedure is performed for a solution in case it is impossible to build a non-empty neighborhood of the current solution, in which a random solution is built.”

In a related field of endeavor, Walton discloses a "restore procedure" (Paragraph 141, wherein Walton discloses a "restore" command for restoration of a back-off factor to its assigned value.)

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate a "restore" command as taught by Walton. The motivation for the combination, being to ensure that a back-up exists for the solutions in cases wherein the user needs to refer back to a previous solution. It would have been obvious to one of ordinary skill in the art to have a restore command for all the solutions whether a best solution or a random solution for the purpose of maintaining an accurate gathering of data which can be used for further reference at a later time.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Mapa whose telephone number is (571)270-5540. The examiner can normally be reached on MONDAY TO THURSDAY 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571)272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Mapa/
Examiner, Art Unit 2617

/NICK CORSARO/
Supervisory Patent Examiner, Art Unit 2617